

PATENT SPECIFICATION

358,305

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PROVISIONAL SPECIFICATION.

Improvements in or relating to Portable Weighing Machines for Locomotives and other Rail Vehicles.



We, HENRY BROSCOMBE, of 7, Willow Crescent, Halton, Leeds, in the County of York, and ALBERT FIELDHOUSE KELLETT, of 24, York Place, Leeds, aforesaid, both British subjects, do hereby declare the nature of this invention to be as follows:—

This invention relates to portable weighing machines for locomotives and other rail vehicles for the purpose of ascertaining the load which each vehicle spring is carrying.

Portable weighing machines for this purpose as hitherto proposed have comprised a balance arm pivotally mounted upon a frame adapted to engage and be clamped to the running rail so as to lie outside the rail track and rest at its outer end upon an adjustable foot engaging the ballast or ground, the inner end of said balance arm being formed with an apex or pointed bearing to engage the tread of a vehicle wheel and raise the latter from the rail when the other end of said balance arm is depressed by the action of a pump disposed above the latter and connected by links to the outer end of the frame. The pump has had associated therewith an indicator for giving readings of the weights raised, and the bearing for the fulcrum of the balance arm has been vertically adjustable on the frame so as to render the machine applicable to rails of different heights.

With this kind of weighing machine the apex or pointed bearing for engaging the wheel tread can only engage and lift the wheel when the flange of the latter is close up to the running rail so as to provide a sufficient overhang of the wheel tread beyond the outside of the rail. By reason of the amount of play necessary between the rails and the adjacent faces of the wheel flanges to enable a vehicle to negotiate curves, the desirable state of sufficient wheel tread overhang when a vehicle comes to rest on a straight rail track, such as in an engine shed, is seldom realised at both sides and it is necessary to "push over" the locomotive or vehicle to one side or the other to enable weighings to be obtained with machines as above described. Moreover it is found in prac-

[Price 1/-]

tice that, by reason of the clamping of the weighing machine frame through the medium of a hook or hooks engaging around the underside of the rail, the action of the pump in depressing the outer end of the balance arm causes the foot upon which the outer end of the frame rests to dig into the ballast or ground.

Now the object of the present invention is the provision of a new or improved weighing machine of the balance arm type whereby the difficulties above set forth will be overcome.

According to the invention, the weighing machine frame is adapted to engage the inside of the running rail and to overhang a pit between the rails, while one end of the balance arm is adapted to engage the flange of the wheel to raise the latter when the other end of the balance arm is depressed by a pump. That end of the machine frame engaging the rail may rest either directly on the sill of the pit or upon a metal plate thereon, and both ends of the balance arm may be formed or provided with a V-shaped bearing, one for engagement with the wheel flange immediately below the wheel centre, and the other for engaging the plunger of the pump, while the fulcrum bearing for the balance arm may be horizontally as well as vertically adjustable to permit of adjustment toward or away from the rail so that the V-shaped bearing at that end of the balance arm can be correctly engaged with a wheel flange either close to or distanced somewhat from the rail and to be adjusted for the height of the latter. Instead of mounting the pump above the balance arm it may be suspended therefrom by links so as to be disposed below the overhanging portion of the machine frame and the pump plunger or the like may bear upon the underside of the frame when the pump is actuated so as to pull down the adjacent end of the balance arm. This suspension of the pump within the pit avoids fouling of the pump by brake rods or other mechanism beneath the vehicle and renders the taking of load readings easier for workers in the pit. The ends of the machine frame

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engaging the inside of the rail may be toothed or serrated to afford a good grip when the machine is under load. In the absence of any positive clamping means for securing the machine frame to the rail it is found that the overhanging end of the machine frame tends to lift when the load is applied, and in order to overcome this tendency that end of the machine frame may be connected by a rod or link to a pair of toggle arms or levers the free ends of which engage the sides of the pit to resist any lift when the load is applied to the machine. In this connection the same toggle mechanism may be connected to the overhanging frames of two weighing machines, one on each side of the pit,

when it is desired to lift both wheels on one axle simultaneously.

It will be seen that the present invention provides a weighing machine of the balance arm type whereby the weighing can be done within the wheel gauge and beneath a vehicle without the machine being clamped to a rail and without having to "push over" the vehicle to afford wheel overhang.

Dated this 18th day of October, 1930.

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COMPLETE SPECIFICATION.

Improvements in or relating to Portable Weighing Machines for Locomotives and other Rail Vehicles.

We, HENRY BROSCOMBE, of 7, Willow Crescent, Halton, Leeds, in the County of York, and ALBERT FIELDHOUSE KELLETT, of 24, York Place, Leeds, aforesaid, both British subjects, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to portable weighing machines for locomotives and other rail vehicles for the purpose of ascertaining the load which each vehicle spring is carrying.

Portable weighing machines for this purpose as hitherto proposed have comprised a balance arm pivotally mounted upon a frame adapted to engage and be clamped to the running rail so as to lie outside the rail track and rest at its outer end upon an adjustable foot engaging the ballast or ground. the inner end of said balance arm being formed with an apex or pointed bearing to engage the tread of a vehicle wheel and raise the latter from the rail when the other end of said balance arm is depressed by the action of a pump disposed above the latter and connected by links to the outer end of the frame. The pump has had associated therewith an indicator for giving readings of the weights raised. and the bearing for the fulcrum of the balance arm has been vertically adjustable on the frame so as to render the machine applicable to rails of different heights.

With this kind of weighing machine the apex or pointed bearing for engaging the wheel tread can only engage and lift the

wheel when the flange of the latter is close up to the running rail so as to provide a sufficient overhang of the wheel tread beyond the outside of the rail. By reason of the amount of play necessary between the rails and the adjacent faces of the wheel flanges to enable a vehicle to negotiate curves, the desirable state of sufficient wheel tread overhang when a vehicle comes to rest on a straight rail track, such as in an engine shed, is seldom realised at both sides and it is necessary to "push over" the locomotive or vehicle to one side or the other to enable weighings to be obtained with machines as above described. Moreover, it is found in practice that, by reason of the clamping of the weighing machine frame through the medium of a hook or hooks engaging around the underside of the rail, the action of the pump in depressing the outer end of the balance arm causes the foot upon which the outer end of the frame rests to dig into the ballast or ground.

The present invention has for an object to provide a new or improved weighing machine of the balance arm type whereby the difficulties above set forth will be overcome.

According to the present invention, the frame of a weighing machine of the balance arm type is adapted to engage the inside of the running rail and to overhang the pit between the running rails, whilst one end of the balance arm of the machine is adapted to engage the flange of the vehicle wheel to raise the latter when the other end of said balance arm is acted upon by means of a pump.

The machine frame may rest near that end at which it engages the running rail directly upon the sill of the pit or upon a metal plate thereon, whilst the corresponding end of the balance arm carries a V-shaped bearing for engagement with the flange of a wheel immediately below the centre of the latter, the other end of said balance arm being formed for engagement with the plunger of the pump. Preferably also, the fulcrum bearing for the balance arm is adjustable in position horizontally as well as vertically so that the V-shaped bearing adapted to co-operate with the flange of a wheel can be correctly engaged with such flange either when it is close to or spaced somewhat from the rail and whatever its height within limits.

Preferably, the pump is so arranged as to extend downwardly within the pit from that end of the machine frame remote from the running rail, and the plunger thereof is adapted to be linked, as by a stirrup, to the corresponding end of the balance arm.

If desired, the end of the machine frame which engages the inside of the rail may be toothed, serrated or otherwise formed to afford a good grip when the machine is in use. In some cases two machine frames with their associated balance arms and pumps may be linked together end to end so that their outer ends engage the running rail at opposite sides of the pit, and with a view to restraining the machine frame against any tendency to lift at that end remote from the running rail when the machine is in use, this tendency being specially noticeable when only a single machine is in use, that end of the machine frame may be connected by a rod or link to a pair of toggle arms or levers, the free ends of which engage the opposite sides respectively of the pit so as to prevent any lift when the load is applied to the machine. A single toggle arrangement such as that just mentioned may be employed even when two machines are used end to end across the pit.

The invention is illustrated by the accompanying drawings, Figures 1 and 2 of which shew one form of locomotive weighing machine according to the invention in elevation and in plan respectively.

The weighing machine illustrated comprises actually two units or machines each of which is similar to the other and, as will be explained hereinafter, either of these units can be used by itself, although in general it will be more convenient to employ two in the manner illustrated.

Each unit or machine comprises a frame built up from two steel plates 11, 11 which are bolted together in spaced relationship and shaped at their outer ends to

engage with the side of a rail 12 and to bear near their outer ends either upon a chair, as indicated at 13, or upon the side of the pit, as indicated at 14. It should be noted, however, that the engagement of the machine frames comprised by the plates 11 with the rails 12, whether the latter be of the bull head or flat bottom type, will be such that during weighing said frames will be supported by said rails quite independently of the sill of the pit. Each machine frame 11 presents at the top thereof near its outer end a flat seating 15 upon which rests a bearer block 16, which may be moved inwardly and outwardly thereon. This bearer block 16 carries a fulcrum-bearing member 17 for a corresponding balance arm 18 and may be adjusted in height by means of shims, such as that indicated at 19, placed between it and the corresponding bearer block 16. Thus, a V-shaped seating 20 at the outer end of the balance arm 18 may be adjusted in position to engage correctly with the flange, indicated at 21, of a wheel, indicated at 22, whatever be the height of said flange 21 and its distance from the rail 12.

For each unit or machine there is provided a pump 23 of known type having a release valve 24, an operating lever 25 and pressure gauge 26. The plunger of this pump is adapted to be connected with the balance arm 18 by means of a plate 32 and links 27 and a stirrup 28 pivotally connected with said links 27. The inner end of the corresponding balance arm 18 is formed as shewn to engage the stirrup member 28. The pump may, if desired, be secured to the inner end of the corresponding machine frame 11, or, alternatively, it may be suspended solely from the corresponding balance arm, in which position it is supported by the links 27 and the stirrup member 28.

Where a single machine frame and balance arm only are employed, the inner end of the machine frame 11 will be attached by means of a downwardly depending link (not shewn) to a pair of toggle arms or levers expanded between opposite walls 29 of the pit against which latter their free ends engage. By this means any tendency of the inner end of the frame 11 to lift when the machine is in use may easily be resisted.

In the case illustrated, however, such an arrangement will not always be necessary as the inner ends of the two machine frames 11 are linked together by a stay 30. Preferably, the connection of this stay with the balance arm is such, as by means of slots indicated at 31, as to permit the pair of machine frames to be engaged with running rails set to gauges which vary

within limits. In some cases, although not so shewn, it may be desirable that the means linking the inner ends of the machine frames 11 should be capable of
 5 forcing the machine frames apart from one another into firm engagement at their outer ends with the running rails.

It will be seen that each unit or machine is of a very simple nature indeed, comprising three main parts,
 10 namely, a pump, of which the pressure gauge may be calibrated to read "weights", directly, the frame of the machine, the balance arm and the bearer block and fulcrum bearing. Moreover, by
 15 the present invention there is provided a weighing machine of the balance arm type, whereby all the operations of weighing can be carried out within the wheel gauge and beneath a vehicle without any
 20 necessity of clamping the weighing machine to a rail, and without having to move the vehicle laterally of the rails to enable the machine to be engaged with
 25 the wheels thereof.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we
 30 claim is:—

1. A portable weighing machine of the balance arm type for locomotives and other rail vehicles, wherein the frame of the machine is adapted to engage the inside
 35 of the running rails and to overhang the pit between the running rails, whilst one end of the balance arm of the machine is adapted to engage the flange of the vehicle wheel to raise the latter when the
 40 other end of the balance arm is acted upon by means of a pump.

2. A portable weighing machine as claimed in Claim 1, wherein the machine frame is such as to be capable of resting
 45 near that end at which it engages the running rail upon the sill of the pit, and wherein the corresponding end of the balance arm carries or is formed as a V-shaped bearing for engagement with the
 50 flange of the wheel immediately below the centre of the latter, whilst the other end of said balance arm is formed for engagement with the plunger of the pump.

3. A portable weighing machine as claimed in Claim 1 or 2, wherein a fulcrum bearing for the balance arm is adjustable in position horizontally as well
 55 as vertically so that the V-shaped bearing of the balance arm which is adapted to co-operate with the flange of the wheel can be correctly engaged with such flange
 60 either when the latter is close to or spaced from the rail and whatever its height within limits.

4. A portable weighing machine as claimed in Claim 1, 2 or 3, wherein the pump is so arranged as to extend downwards within the pit from that end of
 65 the machine frame remote from the running rail, and the plunger of said pump is adapted to be linked as by a stirrup to the corresponding end of the balance arm.
 70

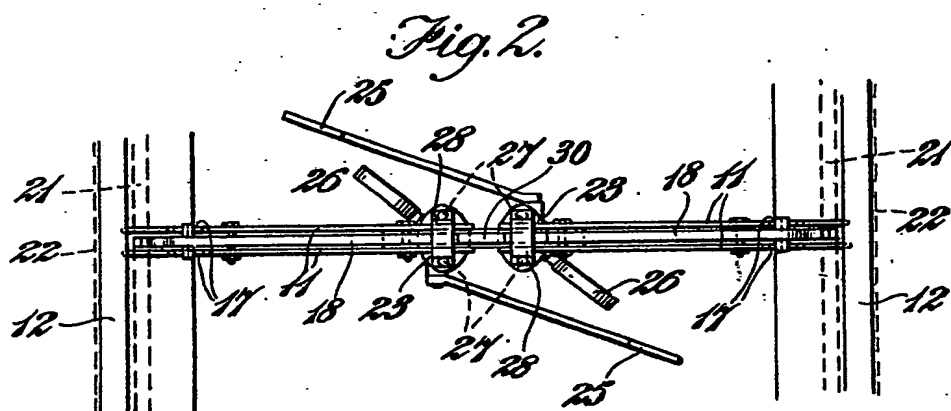
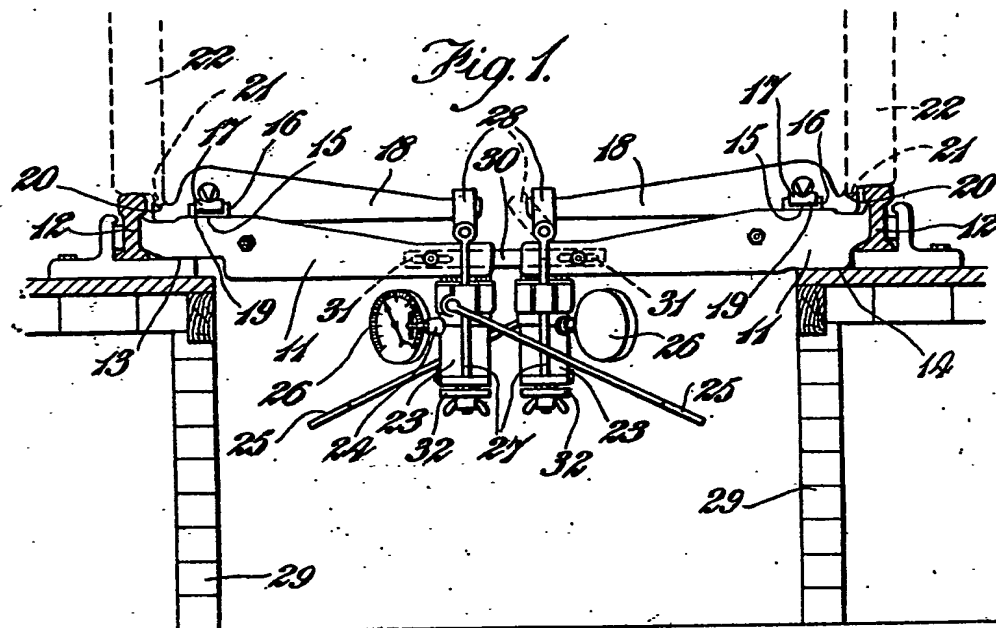
5. A portable weighing machine as claimed in any preceding claim, wherein the frame of the machine is such that two
 75 machine frames with their associated balance arms and pumps may be linked together end to end so that their outer ends engage with the running rail at opposite
 80 sides of the pit.

6. A portable weighing machine as claimed in any preceding claim, wherein, with a view to restraining the machine frame against any tendency to lift at that
 85 end remote from the running rail when the machine is in use, there is provided a pair of toggle arms or levers, the free ends of which are adapted to engage the opposite sides respectively of the pit, and a
 90 link or rod whereby the inner end of the machine frame may be connected with said toggle arms or levers so as to prevent any lift when a load is applied to the machine.

7. A portable weighing machine for locomotives and other rail vehicles, substantially as hereinbefore described with
 95 reference to the accompanying drawings.

Dated the 20th day of July, 1931.

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[This Drawing is a reproduction of the Original on a reduced scale.]

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